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WILLIAMS, MORGAN & AMERSON				
10333 RICHMOND, SUITE 1100				
HOUSTON, TX 77042				
EXAMINER				
CULBRETH, ERIC D				
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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/784,739
Filing Date: February 23, 2004
Appellant(s): BECK ET AL.

Mr. Jeffrey A. Pyle, Attorney
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 9/22/08 appealing from the Office action
mailed 2/11/08.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,517,414	HROVAT	5-1996
4,898,257	BRANDSTADTER	2-1990
6,481,806	KRUEGER ET AL	11-2002
5,762,,407	STACEY ET AL	6-1998

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-5, 7-11, 13-15, 17-22, 44-48, 50-54, 56-58, and 60-63 stand rejected under 35 U.S.C. 103(a) as being unpatentable over US 5517414 to Hrovat in view of US 4895257 to Brandstadter. Hrovat discloses a traction control system with active suspension comprising the following:

- a. A method of controlling traction in a vehicle having a suspension capable of rotatably articulating, comprising: determining a performance characteristic of a wheeled vehicle; determining a performance characteristic of at least one of a plurality of wheel assemblies of the rotatably articulating suspension; comparing the performance characteristic of the vehicle and the performance characteristic of the at least one of the plurality of wheel assemblies; and altering the performance of the vehicle based upon the comparison to affect the vehicle's traction (Fig. 6b) (claim 1.)
- b. Determining the performance characteristic of the vehicle comprises determining a velocity of the vehicle; and determining the performance

characteristic of the at least one of the plurality of wheel assemblies comprises determining a rotational velocity of the at least one of the plurality of wheel assemblies (col 2, line 51-67) (claim 2, 45.)

c. Determining the performance characteristic of the vehicle comprises a load on a first of a plurality of wheel assemblies; and determining the performance characteristic of the at least one of the plurality of wheel assemblies comprises a load on another one or more of the plurality of wheel assemblies (Fig. 5b) (claim 3, 46.)

d. A method of controlling traction in a wheeled vehicle having a rotatably articulating suspension, comprising: determining a load on each of a plurality of wheel assemblies of the rotatably articulating suspension; and adjusting the suspension through rotation such that each of the loads is within a predetermined range (Fig. 5b) (claim 4.)

e. Determining the load comprises sensing a load on each suspension arm 86 of the plurality of wheel assemblies (claim 5, 48.)

f. Adjusting the rotatably articulating suspension comprises adjusting the rotatably articulating suspension to substantially equalize the loads (Fig. 5b) (claim 7, 50.)

g. Adjusting the rotatably articulating suspension comprises articulating at least one of the plurality of wheel assemblies with respect to a chassis of the vehicle (Fig. 2 – admitted prior art) (claim 8, 51.)

- h. Determining a lightly loaded wheel assembly of the plurality of wheel assemblies, such that adjusting the rotatably articulating suspension comprises articulating the lightly loaded wheel assembly with respect to a chassis of the vehicle (Figs. 2 – admitted prior art, 5b) (claim 9, 52.)
- i. A method of controlling traction in a wheeled vehicle having a rotatably articulating suspension, comprising: acquiring load data for a plurality of wheel assemblies of the rotatably articulating suspension; identifying a lightly loaded wheel assembly of the plurality of wheel assemblies from the load data; and rotatably articulating the lightly loaded wheel assembly with respect to a chassis of the wheeled vehicle (Figs. 5a, 5b) (claim 10.)
- j. Acquiring the load data comprises sensing a load on each suspension arm 86 of the plurality of wheel assemblies (claim 11, 54.)
- k. Articulating the lightly loaded wheel assembly comprises articulating the lightly loaded wheel assembly to substantially equalize the load on each of the plurality of wheel assemblies (Fig. 5b) (claim 13, 56.)
- l. A method of controlling traction in a wheeled vehicle having a rotatably articulating suspension, comprising: determining whether forces on each of a plurality of wheel assemblies of the rotatably articulating suspension are substantially equal; determining whether a rotational velocity of each wheel of the plurality of wheel assemblies corresponds to a velocity of the wheeled vehicle; and rotatably articulating the articulated suspension such that each of the forces is within a predetermined range if the forces are not substantially equal and at

least one of the rotational velocities fails to correspond to the velocity of the wheeled vehicle (Figs. 5a, 5b) (claim 14.)

m. Determining whether forces on each of a plurality of wheel assemblies of the rotatably articulating suspension are substantially equal comprises sensing a load on each suspension arm 86 of the plurality of wheel assemblies (claim 15, 58.)

n. Rotatably articulating the articulated suspension comprises adjusting the articulated suspension to substantially equalize the forces (Fig. 5b) (claim 17, 60.)

o. Adjusting the rotatably articulating suspension comprises articulating at least one of the plurality of wheel assemblies with respect to a chassis of the vehicle (Figs. 2 – admitted prior art, 5b) (claim 18, 61.)

p. Determining a lightly loaded wheel assembly of the plurality of wheel assemblies, such that adjusting the rotatably articulating suspension comprises articulating the lightly loaded wheel assembly with respect to a chassis of the vehicle (Figs. 2 – admitted prior art, 5a, 5b) (claim 19, 62.)

q. Reducing the rotational velocity of one of the tires if the forces are substantially equal and the one of the tires has a determined rotational velocity that is greater than that which corresponds to the velocity of the vehicle (col 1, line 57-58) (claim 20, 63.)

r. Reducing the rotational velocity comprises reducing the rotational velocity of the tire by braking (col 7, line 25) (claim 21.)

- s. Reducing the rotational velocity comprises reducing the rotational velocity of the tire by at least partially removing power to the tire (col 1, line 57-59) (claim 22.)
- t. A wheeled vehicle, comprising: a chassis; a suspension 86 rotatably articulating relative to the chassis and including a plurality of wheel assemblies 20a, 20b, 20c, 20d; means for determining a performance characteristic of the wheeled vehicle; means for determining a performance characteristic of at least one of a plurality of wheel assemblies of the rotatably articulating suspension; means for comparing the performance characteristic of the wheeled vehicle and the performance characteristic of the at least one of the plurality of wheel assemblies; and means for altering the performance of the vehicle based upon the comparison to affect the wheeled vehicle's traction (Figs. 2, 6b) (claim 44.)
- u. A wheeled vehicle, comprising: a chassis; a suspension 86 rotatably articulating relative to the chassis and including a plurality of wheel assemblies 20a, 20b, 20c, 20d; means for determining a load on each of a plurality of wheel assemblies of the rotatably articulating suspension; and adjusting the suspension through rotation such that each of the loads is within a predetermined range (Figs. 2, 5b) (claim 47.)
- v. A wheeled vehicle, comprising: a chassis; a suspension 86 rotatably articulating relative to the chassis and including a plurality of wheel assemblies 20a, 20b, 20c, 20d; means for acquiring load data for a plurality of wheel assemblies of the rotatably articulating suspension; means for identifying a lightly

loaded wheel assembly of the plurality of wheel assemblies from the load data; and means for rotatably articulating the lightly loaded wheel assembly with respect to a chassis of the wheeled vehicle (Figs. 2, 5a, 5b) (claim 53.)

w. A wheeled vehicle, comprising: a chassis; a suspension 86 rotatably articulating relative to the chassis and including a plurality of wheel assemblies 20a, 20b, 20c, 20d; means for determining whether forces on each of a plurality of wheel assemblies of the rotatably articulating suspension are substantially equal; means for determining whether a rotational velocity of each wheel of the plurality of wheel assemblies corresponds to a velocity of the wheeled vehicle; and means for rotatably articulating the articulated suspension such that each of the forces is within a predetermined range if the forces are not substantially equal and at least one of the rotational velocities fails to correspond to the velocity of the wheeled vehicle (Figs. 5a, 5b) (claim 57.)

x. Hrovat does not teach a suspension capable of rotatably articulating in a plane defined by the pitch of the vehicle. Brandstadter discloses an active suspension system and makes known:

y. A suspension capable of rotatably articulating in a plane defined by the pitch of the vehicle (fig 2-3) (claims 1, 4, 10, 14, 44, 47, 57).

z. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the suspension of Hrovat to rotatably articulate in a plane defined by the pitch of the vehicle as taught by Brandstadter so as to accommodate use of the system on off-road vehicles that commonly use

suspensions that articulate in the plane defined by the pitch of the vehicle (background).

Claims 6, 12, 16, 49, 55, and 59 stand rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,517,414 to Hrovat in view of US 4,895,257 to Brandstadter, and further in view of US 6,481,801 to Krueger et al. The disclosure of Hrovat is discussed above. Hrovat does not teach measuring wheel load using tire pressure sensors. Krueger discloses an understeer correction device and teaches the following:

- aa. Determining the load comprises sensing a pressure of each tire of the plurality of wheel assemblies (abstract, col 4, line 39-58) (claim 6, 49.)
- bb. Acquiring the load data comprises sensing a pressure of each tire of the plurality of wheel assemblies (abstract, col 4, line 39-58) (claim 12, 55.)
- cc. Determining whether forces on each of a plurality of wheel assemblies of the rotatably articulating suspension are substantially equal comprises sensing a pressure of each tire of the plurality of wheel assemblies (abstract, col 4, line 39-58) (claim 16, 59.)

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the traction control system of Hrovat to include tire pressure sensors as taught by Krueger so as to measure the normal forces between wheels and the ground that can be used to dynamically alter the vehicle suspension characteristics.

Claim 23 stands rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,517,414 to Hrovat in view of US 4,895,257 to Brandstadter, and further in view of US 5,762,407 to Stacey et al. The disclosure of Hrovat is discussed above. Hrovat does

not teach regenerative braking. Stacey discloses a brake system control and apparatus and teaches the following:

- dd. Reducing the rotational velocity comprises reducing the rotational velocity of the tire by regenerative braking (col 5, line 40-60.)

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the traction control system of Hrovat to include regenerative brake blending capabilities as taught by Stacey so as to more quickly counter wheel slip.

(10) Response to Argument

The appellant's arguments have been carefully considered but deemed not persuasive in overcoming the rejections.

The appellant argues on pages 12-13 of the Appeal Brief that Brandstadter teaches away from using an on-road active suspension in off-road vehicles (actually, the appellant's remarks are confusing, stating in the lower half of page 12 that Hrovat is an on-road vehicle and that Brandstadter is for an off-road vehicle, but then stating in the first full paragraph of page 13 that Hrovat is an off-road vehicle). At any rate, this is not persuasive because a combination of teachings is not a bodily incorporation of parts (i.e., the features of Brandstadter in the combination would be adapted for the intended use or terrain to be encountered), because the terms "on-road" and "off-road" in themselves do not patentably distinguish features (i.e., off-road vehicles such as Brandstadter's tank frequently travel on the road, and cars such as Hrovat's frequently travel off the road at beaches, events where one parks on the grass, hiking in wilderness, etc.), and because in the combination of teachings Hrovat's vehicle in fact

could be/would be converted to encounter off-road terrain (note Brandstadter, column 1, lines 15-20 where off-road systems use passive suspension systems; column 1, lines 38-41 where active systems are used for road vehicles; and column 3, lines 26-35 where the object of Brandstadter's invention is to use an active system on an off-road vehicle; in the combination Hrovat would be improved for off road conditions). Contrary to applicant's on page 13, Brandstadter does not "teach away" from using on-road active suspension systems in off-road vehicles such as Hrovat, but rather teaches improving an off-road suspension system by making it an active suspension system, in which case Hrovat's suspension system would be improved for off-road conditions.

On pages 14-15 of the Appeal Brief, the Appellant argues that Brandstadter, column 3, lines 5-25 teaches away from using any on-road active suspension systems off-road (actually, this is reversed; what the Appellant seems to be arguing is that Brandstadter's off-road system cannot be used on an on-road vehicle like Hrovat). However, this is not persuasive because of Brandstadter, column 3, lines 26-35 cited above, where he teaches adapting an active suspension for off-road use is the very object of his invention. Brandstadter's disclosure of using active suspensions, previously used with on-road suspensions, on an off-road suspension at column 3, lines 26-35 and column 1, lines 38-41 above hence provide support for the examiner's statements cited on page 15 of the Appeal Brief (that the skilled artisan would understand the conditions for which a suspension arrangement is suitable and hence design the suspension for the conditions to be encountered, and that the mechanics of on-road and off-road vehicles are often the same but adapted for particular conditions).

On pages 16-17 of the Appeal Brief, the Appellant argues that Brandstadter does not say it is incorporating an on-road active suspension into an off-road vehicle. However, Brandstadter is teaching the concept of using an active suspension in an off-road vehicle, and as a combination of references is a combination of teachings rather than a bodily incorporation of parts, it would have been obvious to one of ordinary skill in the art to combine the teachings in order to make Hrovat more suitable for off-road conditions. The text cited by the Appellant on pages 16-17 of the Brief (column 2, lines 6-24 of Brandstadter ("...this type of system is not applicable to off road vehicles generally and to combat vehicles specifically")) is obviously referring to prior art suspensions, and not to all active suspensions, since Brandstadter goes on in his specification to disclose an active suspension for off-road vehicles. Since the combination of Hrovat and Brandstadter would result in an off-road vehicle (note the last sentence of the final rejection of claims 1-5, etc.), the advantages of Brandstadter cited at column 3, lines 26-35 would be included in the combination (page 17 of the Appeal Brief).

As Hrovat and Brandstadter meet the limitations of the claims, the combinations with Krueger and Stacey et al are also proper.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Art Unit: 3616

Respectfully submitted,

/Eric Culbreth/

Primary Examiner, Art Unit 3616

Conferees:

Lesley Morris /LDM/

John Q. Nguyen /JN/